

**B. Construct and Maintain Dock**

After the dock is constructed satisfactorily, 60 percent of the Lump Sum price bid will be paid. If the dock maintenance remains satisfactory, the remaining 40 percent of the Lump Sum price bid will be paid in monthly increments based on the percent complete of the Contract.

**C. Maintain and Remove Dock**

When the dock was constructed for use on a previous Project or Contract as defined in Subsection 613.3.07.A.3, the Contractor who satisfactorily maintains and removes the dock will be paid 50 percent of the Lump Sum price bid in monthly increments based on the percent complete of the Contract.

When the dock is removed, the remaining 50 percent of the Lump Sum price bid will be paid on the next monthly statement.

**D. Maintain Docks**

When the Contractor assumes satisfactory maintenance of the dock as provided in Subsection 613.3.07.A, the Lump Sum price bid will be paid in monthly increments based on the percent complete of the Contract.

Payment will be made under:

Item No. 613	Construct, maintain, and remove dock No. _____	Per lump sum
Item No. 613	Construct and maintain dock No. _____	Per lump sum
Item No. 613	Maintain and remove dock No. _____	Per lump sum
Item No. 613	Maintain dock No. _____	Per lump sum

**613.5.01 Adjustments**

General Provisions 101 through 150.

## **Section 615—Jacking or Boring Pipe**

**615.1 General Description**

This work includes installing different sizes and types of pipe by jacking or boring through various materials.

**615.1.01 Definitions**

General Provisions 101 through 150.

**615.1.02 Related References****A. Standard Specifications**

Section 205—Roadway Excavation

Section 208—Embankments

Section 550—Storm Drain Pipe, Pipe-Arch Culverts, and Side Drain Pipe

Section 841—Iron Pipe

Section 847—Miscellaneous Pipe

**B. Referenced Documents**

General Provisions 101 through 150.

**615.1.03 Submittals****A. Handling Method**

Furnish for the Engineer's approval, a plan showing the proposed method of handling, including:

- Design for the jacking head, jacking support, or back stop
- Arrangement and position of jacks, pipe guides, etc., complete as assembled

## B. Welding Procedure

Before welding steel pipe or ductile iron pipe as casing and carrier, submit to the State Materials and Research Engineer a written welding procedure. Include joint details, preheat temperature, and electrodes to be used. Do not use welded steel pipe as a sanitary sewer carrier.

## 615.2 Materials

Use pipe types and sizes that conform to the Plans and the following:

Material	Section
Corrugated Metal Pipe	550
Concrete Pipe	550
Steel Pipe	847.2.02
Ductile Iron Pipe (Plain Ends)	841

### 615.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

## 615.3 Construction Requirements

### 615.3.01 Personnel

General Provisions 101 through 150.

### 615.3.02 Equipment

General Provisions 101 through 150.

### 615.3.03 Preparation

General Provisions 101 through 150.

### 615.3.04 Fabrication

General Provisions 101 through 150.

### 615.3.05 Construction

Dispose of the excavated material from the following jacking or boring operations or use it as directed by the Engineer at no additional cost to the Department.

#### A. Jacking

Follow these requirements when jacking:

- Excavate suitable pits or trenches for the jacking operation and for placing the end joints of pipe, when required. Securely sheet and brace the pits or trenches to prevent caving, where necessary.
- When installing pipe under railroads, highways, streets, or other facilities by jacking or boring, perform construction and prevent:
  - Interfering with the facility operation
  - Weakening the roadbed or structure
- To force the pipe through the roadbed, use a jack with a head constructed to apply uniform pressure around the ring of the pipe.
- Set the pipe to be jacked on guides, braced together to properly support the pipe section and to direct it to the proper line and grade.
- Excavate the roadbed as follows:
  - Excavate roadbed material just ahead of the pipe.
  - Remove the excavated material through the pipe.
  - Ensure that the excavation diameter conforms to the outside diameter and circumference of the pipe as closely as possible.
- Force the pipe through the roadbed into the excavated space.

### 615.3.06

7. Use an approved mix to pressure grout voids that develop during installation and that the Engineer determines are detrimental to the work.
8. Ensure that the excavation does not extend beyond the pipe more than 2 ft. (600 mm).  
Decrease the distance at the Engineer's direction or if the character of the excavated material allows.
9. Jack the pipe from the low or downstream end. The line and grade from the pipe's final position established by the Engineer may vary no more than two percent in lateral alignment and one percent in vertical grade. Ensure that the final grade of the flow line is in the direction indicated on the Plans.
10. Use a cutting edge around the head end. Extend it a short distance beyond the pipe end with inside angles or lugs to keep the cutting edge from slipping back into the pipe.
11. Once the pipe jacking has begun, proceed with the operation without interruption to prevent the pipe from becoming firmly set in the embankment.
12. Remove and replace pipe damaged in jacking operations at no additional expense to the Department.
13. After completing the jacking, immediately backfill the excavated pits or trenches.

#### B. Boring

Proceed with the boring from a pit provided for boring equipment and workmen. Complete these steps:

1. Excavate for pits and shoring installation as outlined above.
2. Locate the pit at the Engineer's approval.
3. Bore the holes mechanically using a pilot hole approximately 2 in. (50 mm) in diameter that is bored the entire length of the installation.
  - a. Check the pilot hole for line and grade on the opposite end of the bore from the work pit.
  - b. Use the pilot hole to serve as the center line of the larger diameter hole to be bored.
4. Place excavated material near the top of the working pit and dispose of it as required. Use water or other fluids with the boring operation to lubricate the cuttings. Do not perform jetting.
5. In unconsolidated soil formations, use a gel-forming colloidal drilling fluid with at least 10 percent of high grade carefully processed bentonite to consolidate excavated material, seal the walls of the hole, and lubricate subsequent removal of material and immediate pipe installation.
6. Ensure that the diameter of the excavation conforms to the outside diameter of the pipe as closely as possible.
7. See Subsection 615.3.05.A, "Jacking," for the allowable variation from line and grade.
8. Use an approved mix to pressure grout voids that develop during the installation operation and that the Engineer determines are detrimental to the Work.

### 615.3.06 Quality Acceptance

General Provisions 101 through 150.

### 615.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

## 615.4 Measurement

Pipe installed by jacking or boring is measured by the linear foot (meter) of pipe complete in place. Measurement is made between the ends of the pipe along the control axis as installed.

### 615.4.01 Limits

General Provisions 101 through 150.

## 615.5 Payment

Work performed and materials furnished as prescribed by this item and measured as provided above will be paid for at the Contract Price per linear foot (meter) for jacking and boring of the pipe type, size, and class specified. Payment is full compensation for furnishing the pipe and the incidentals to complete the Item.

Excavation will not be paid for separately but will conform to Section 205 and Section 208.

Payment will be made under:

Item No. 615	Jack or bore pipe ( <u>type</u> ), ( <u>class</u> ), ( <u>size</u> )	Per linear foot (meter)
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**615.5.01 Adjustments**

General Provisions 101 through 150.

## **Section 617—Permanent Anchored Walls**

**617.1 General Description**

This work includes furnishing materials, labor, tools, equipment, and other incidental items to design, detail, and construct an anchored wall. This Specification applies to any Contractor-proposed alternate design of Department-furnished plans.

**617.1.01 Definitions**

Anchor—Synonymous with the terms tie-back or tie-down.

The term Anchored Wall includes the following items:

- Anchors
- Soldier piles
- Lagging
- Facing
- Drainage

**617.1.02 Related References****A. Standard Specifications**

Section 500—Concrete Structures

Section 511—Reinforcement Steel

Section 853—Reinforcement and Tensioning Steel

**B. Referenced Documents**

General Provisions 101 through 150.

**617.1.03 Submittals****A. Proof of Ability**

Submit the following proof of ability (or ability of the Subcontractor) when requested by the Department to design or construct anchored walls:

- Evidence of successfully completing at least 5 Projects similar in concept and scope to the proposed wall.
- Resumes of foremen, anchor testing personnel, and drilling operators to be employed on this Project. Show the type, length, and number of ground anchors each has installed or tested within the past 5 years.
- Evidence of experience in anchor testing. Persons performing anchor testing must prove experience by performing sample tests supervised by the Engineer.

The Department is the sole judge of the qualifications of the foreman, drilling operator, and testing personnel. Do not begin wall construction until the Engineer has approved proof of ability.

**B. Design Criteria for Alternate Design**

If the Department receives more than 2 submittals of the Plans and calculations for review, the Contractor will be assessed \$60 per hour of engineering time for reviews in excess of the 2 submittals.

**C. Construction Drawings and Design Notes**

If a Contractor-proposed alternate anchored wall is a part of the low bid, submit construction drawings and design notes within 28 days of the date of award of the Contract. The Design Engineer shall prepare and stamp the submission.